United States
Department of Agriculture

Forest Service

Northeastern Area
NA-PR-06-96

Rhizosphaera Needle Disease of Fir

Rhizosphaera pini is a common plant pathogen in the Lake States, Northeastern States and Canada. A closely related pathogen, *Rhizosphaera kalkhoffii*, causes a common needle blight on spruce and other conifers. *R. pini* is often considered to be a weak pathogen, occurring on stressed foliage or foliage killed by other causes. However, it has been observed causing significant damage on balsam fir and Fraser fir. It appears to be particularly damaging in shaded, damp areas and when the trees are under other stress.

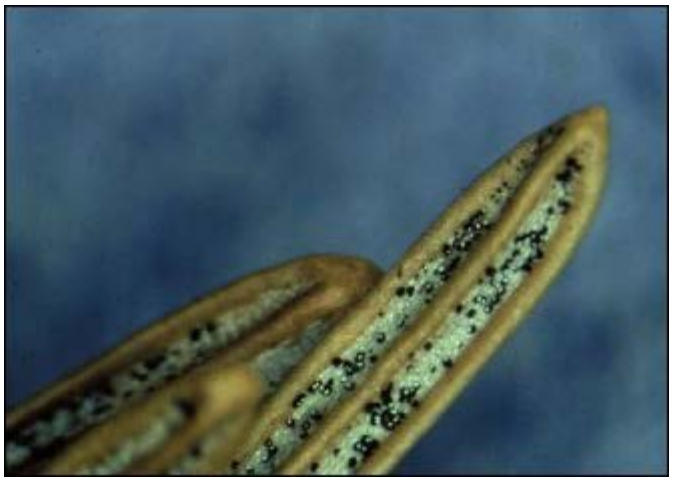
Damage to balsam fir Christmas trees by *R. pini*

Drooping, discolored foliage killed by *R. pini.* Photo taken in May

R. pini can infect virtually any age foliage, causing chlorotic discoloration and eventual needle browning. On balsam fir, infected needles turn greyish tan and droop. Infected needles eventually fall or are broken off.

Although specific conditions for infection are unknown, symptoms often appear following

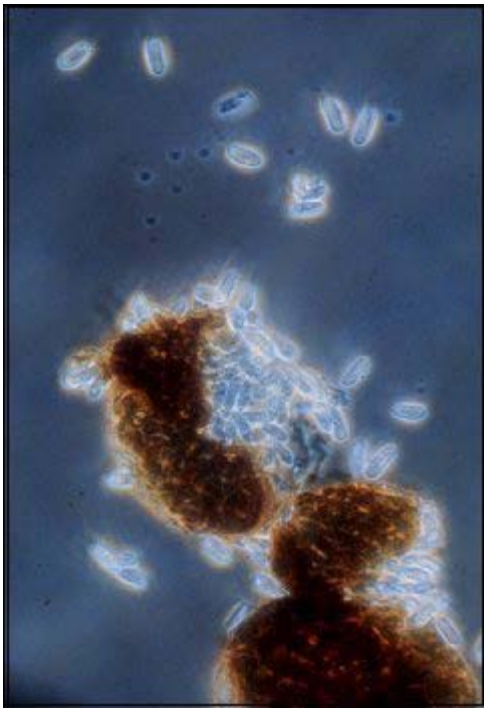
periods of rainy weather and cool temperatures. Pycnidia (fruiting bodies) with conidia (spores) can be produced weeks to months following infection, and may occur on either green or discolored needles. The fungus may be able to produce many generations of con idia throughout the year if local temperature and moisture conditions permit continued fungal development.



Black fruiting bodies of *R. pini* emerging from the stomata on the underside of green needles. They may also occur on brown needles.

Fruiting bodies: Black subglobose pycnidia emerge from stomata in rows, carrying the waxy stomatal plug on top. They are 50-65 x 55- 125 um in size. The conidia are hyaline, aseptate, elliptic to ovoid, rounded at the ends, and measure 15-32 x 7-12 um.

Microscopic view of "squashed" pycnidia and spores of *R. pini.*



Cultural Management in Christmas Tree Plantations

Fungicide recommendations have not yet been developed for control of *R. pini* on balsam or Fraser fir. The best control is cultural management to avoid stress and conditions favorable to the pathogen.

- Do not grow fir in areas where cool moist air collects and stagnates on a daily basis during the growing season.

- Do not leave live, infected branches on stumps of harvested Christmas trees; they serve as disease reservoirs.

- Promote good air movement by providing adequate space between trees, controlling weeds, and pruning off lower branches.

- Do not shear infected foliage during wet weather because spores released at this time may be carried from tree to tree on shearing tools. Sterilize tools after shearing infected portions of plantations.

- Shear healthy plantations first so disease spores will not be carried into them from infected plantations.

Reference:

Funk, A. 1985. Foliar Fungi of Western Trees. Canadian Forestry Service, Pacific Forest Research Centre. 159 pp.

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